

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI, THEODORE G. BILBO,
GOVERNOR; E. N. LOWE, DIRECTOR, STATE GEOLOGICAL SURVEY.

SOIL SURVEY OF NEWTON COUNTY,
MISSISSIPPI.

BY

A. L. GOODMAN, OF THE U. S. DEPARTMENT OF AGRICULTURE,
IN CHARGE, AND E. M. JONES, OF THE MISSISSIPPI
GEOLOGICAL SURVEY.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1916.]



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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., August 30, 1917.

SIR: Under the cooperative agreement with the Mississippi Geological Survey a soil survey of Newton County was carried to completion during the field season of 1916. The selection of this area was made after conference with State officials.

I have the honor to transmit herewith the manuscript and map covering this work and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1916, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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SOIL SURVEY OF NEWTON COUNTY, MISSISSIPPI.

By A. L. GOODMAN, of the U. S. Department of Agriculture, In Charge, and
E. M. JONES, of the Mississippi Geological Survey.—Area Inspected by HUGH
H. BENNETT.

DESCRIPTION OF THE AREA.

Newton County is situated in the east-central part of Mississippi, being separated from the State of Alabama by only one tier of counties. The county is made up of 16 land townships and is square in outline. It is bounded on the north by Neshoba County, on the east by Lauderdale County, on the south by Jasper County, and on the west by Scott County. It has an area of 579 square miles, or 370,560 acres.

Newton County lies wholly within the broad physiographic division known as the Coastal Plain. It represents a plain much dissected by streams, which have cut narrow valleys of varying depth. There is considerable variation in the surface configuration in different parts of the county. The first bottoms along the streams are essentially level, the second bottoms level to faintly billowy in places. The uplands, comprising by far the greater part of the area of the county, include level to undulating prairie, much gently and moderately rolling country, and considerable hilly or ridgy and rough land. The roughest areas occur in the two northern townships bordering the Lauderdale County line, where a large proportion of the land consists of narrow, winding, rocky ridges with steep slopes. This area is locally known as the "Tallahatta Hills." Another rough and broken section occurs west of Decatur, along the headwaters of Turkey Creek, and north of Conehatta along Box and Conehatta Creeks. From Union eastward along the Neshoba County line for about 5 miles there is a rather high and nearly level area. The southwestern corner of the county, comprising about three townships, is composed largely of level or undulating prairie and sandy or silty uplands. The uplands

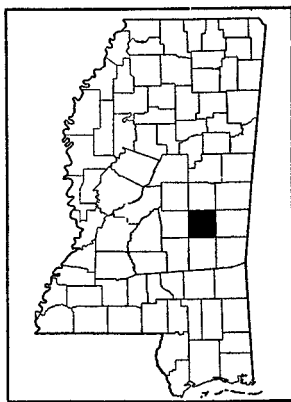


FIG. 1.—Sketch map showing location of the Newton County area, Miss.

in the vicinity of Newton, Hickory, and Hazel, and east of Decatur are gently rolling to rolling and hilly.

The elevation above sea level at Newton is 412 feet, and at Union 471 feet. Some peaks of the Tallahatta Hills in the vicinity of Battlefield School probably reach 500 feet or more above sea level.

The northeastern part of the county is drained by Tallasher and Tallahatta Creeks, which flow almost due south. The central part is drained by Chunky, Oakahatta, Turkey, and Potterchitto Creeks. These streams follow a southeasterly direction, and during the greater part of the year have a rather sluggish flow. The western part of the county is drained by Tallahala, Quarterliah, Tuscolameta, and Conehatta Creeks. The first-named two streams flow due south, while Tuscolameta Creek flows almost due north, the divide lying about $1\frac{1}{2}$ miles south of the Alabama & Vicksburg Railway. A large number of widely ramifying branches and intermittent streams give adequate drainage throughout the uplands. There is hardly a 40-acre tract of land in the county, outside the prairie section, that is not reached by a drainage way.

All the first bottoms throughout the county are subject to overflow and are for the most part forested. Overflow waters remain on the surface for only short periods. Almost all the stream valleys include quite wide, practically level second bottoms or terraces, no longer subject to overflow.

Newton County was organized in 1836. It is part of the territory purchased by the United States Government from the Choctaw Indians in 1830 under the so-called Dancing Rabbit Creek treaty. The county prior to the signing of this treaty is said to have been inhabited by 3,000 to 5,000 Indians. About 100 of this number are at the present time in the county. The first white settlers came from Wayne, Simpson, Hinds, and Copiah Counties and were originally from Georgia and South Carolina.

The population of Newton County in 1910 is reported by the census as 23,085. The largest town is Newton, with a population of 1,878. Settlement is well distributed throughout the county, except in the northeastern part, including three townships bordering on the Lauderdale County line. This section of the county is mostly in forest or recently cut over lands, and is very thinly settled. The average population per square mile in 1910 was 40.6. Decatur, with a population of 283, is the county seat. It is situated near the center of the county. Other towns of importance are Union, with a population of 693; Hickory, with a population of 600; Chunky, with a population of 280; Lawrence, with a population of 175; Conehatta, with a population of 152; Little Rock, with a population of 150; and Duffee, with a population of about 85.

Transportation facilities are good, the county being traversed east and west by the Alabama & Vicksburg Railway and north and south by the New Orleans, Mobile & Chicago Railroad. The Meridian & Memphis Railway runs from Union to Meridian in Lauderdale County, crossing the northeastern section of the county, and the Jackson & Eastern, a newly constructed railroad, runs from Union to Sebastopol, in Scott County, giving transportation facilities to the northwestern section of the county.

About 20 miles of rock-surfaced road have been constructed in the vicinity of Newton, and about 15 miles of sand-clay roads are now under construction. The public roads are worked under the contract system, and are in good condition the greater part of the year. All sections of the county are reached by rural mail routes, and telephones are in general use. Good schools and churches are situated at convenient places throughout the county. Many of the rural schools are consolidated.

Meridian, Jackson, Vicksburg, Laurel, Mobile, and Birmingham constitute the principal markets for the farm products of Newton County. Much of the lumber shipped from the county goes to northern markets, including Chicago and New York.

CLIMATE.

Newton County has a mild, healthful climate, with an average growing season of 224 days, which is long enough to mature a great variety of crops. The average date of the last killing frost in the spring is March 24, and that of the first in the fall, November 2. The latest recorded date of killing frost in spring is April 10, and the earliest in fall October 21. Generally about March 15 the danger of heavy frost has passed, and corn planting begins at this time. Cotton is seldom planted before April 1. The mean annual precipitation of 51.20 inches is usually quite evenly distributed throughout the year, but is normally lightest during the fall months, giving excellent weather for harvesting crops. The winters are so mild that expensive buildings to house stock are not required, and farming operations can go on almost uninterruptedly for 10 months of the year. In some winters there is no snowfall, but the average is from 2 to 4 inches.

The Weather Bureau has no station in Newton County, but the climatic conditions are indicated in the table below, which is compiled from the records of the station at Lake, just across the county line in Scott County.

Normal monthly, seasonal, and annual temperature and precipitation at Lake, Scott County.

Month.	Temperature (mean).	Precipitation.		
		Mean.	Total amount for the driest year (1910).	Total amount for the wettest year (1909).
	° F.	Inches.	Inches.	Inches.
December.....	46.6	4.38	4.77	3.51
January.....	45.6	4.78	2.12	2.96
February.....	46.7	6.33	5.74	8.37
Winter.....	46.3	15.49	12.63	14.84
March.....	57.2	5.19	.67	7.15
April.....	64.0	4.11	6.59	6.84
May.....	70.2	4.13	3.26	16.35
Spring.....	63.8	13.43	10.52	30.34
June.....	77.7	4.71	7.07	9.82
July.....	79.9	5.13	2.41	3.76
August.....	79.2	4.80	.96	5.80
Summer.....	78.9	14.64	10.44	19.38
September.....	74.3	2.72	2.20	2.96
October.....	62.3	2.18	3.33	.86
November.....	53.1	2.74	2.57	.75
Fall.....	63.2	7.64	8.10	4.57
Year.....	63.2	51.20	41.69	69.13

AGRICULTURE.

The production of cotton has been the principal farming industry in Newton County almost from the days of the earliest settlement. Cotton has been the money crop to the practical exclusion of other products of the farm. Corn has been grown since the earliest days, but this crop has been produced, as it still is, principally as feed for the work stock and the few hogs and cattle kept on most farms, and for making meal, hominy, and grits for home use. Sugar cane and sorghum for sirup, and cowpeas, oats, and sweet potatoes are among the minor crops which have long been grown for home use. This year (1916) several carload lots of sweet potatoes were shipped to northern markets. In recent years velvet beans and soy beans have been introduced as soil-improving and forage crops, and there has been some increase in the number of beef cattle raised, together with the production of some milk and cream for market in the south-western part of the county. There also has been some improvement in the breed of hogs kept and a slight increase in the number raised.

The increased attention to live stock is due to the large decrease in cotton production caused by the boll weevil, which made its appearance in this county during the latter part of 1909. As yet the sale of beef cattle is rather small. In 1916 one farm in the southwestern or prairie section of the county had 600 to 700 head of beef cattle grazing on pasture land. More beef cattle are raised in the prairie section of the county than elsewhere. Here there are a considerable number of fenced areas devoted exclusively to pasturing cattle and hogs. Considerable hay is cut and stacked in this part of the county for use as winter feed on the farm and to some extent for sale. Elsewhere cattle and hogs are pastured scatteringly through the woods of the upland and bottoms, where they find much excellent pasturage consisting of the grasses, cane, and other native plants. On most farms having a few head of cattle some hay is put up for winter use. Large stock farms are found only in the southern part of the county.

According to the census, Newton County in 1889 produced 35,117 bales of cotton, in 1899 only 14,459 bales, and in 1909, 12,279 bales. In 1911 the production was 19,178 bales and in 1913, 2,451 bales. This year (1916) the cotton crop suffered unusually, owing to storms and severe ravages of the boll weevil, and was probably the smallest since the Civil War, amounting to only about 2,000 bales. The production of corn has also varied considerably. In 1889 there were 25,757 acres planted, producing 392,619 bushels; in 1899, 23,500 acres, producing 541,170 bushels; and in 1909, 29,798 acres, producing 305,738 bushels. Since 1909 the acreage of corn has steadily increased and the yields have been generally higher as a result of improved methods of cultivation. This year (1916) the corn crop is very short, owing to damage by severe storms.

Oats in 1909 occupied 4,187 acres, producing 49,886 bushels. Hay was cut from a total of 4,003 acres, of which 715 acres were in tame grasses, 1,680 acres in wild grasses, and 1,608 acres in grains cut green. Cowpeas occupied 2,588 acres, sweet potatoes 796 acres, and all other vegetables 718 acres. There were 584 acres in sugar cane, producing 5,696 tons of cane and 71,158 gallons of sirup, and 200 acres in sorghum, producing 97 tons of cane and 828 gallons of sirup.

The 1910 census reports 29,533 peach trees in the county, 9,162 apple trees, and 787 grapevines. There were 1,362 fig trees in 1909, producing 44,775 pounds of fruit, and 2 acres of strawberries, producing 2,825 quarts of fruit.

A larger proportion of the land is in cultivation on the well-drained uplands of the prairie section and on the gently rolling sandy and silty soils than elsewhere throughout the county, including the overflowed bottom lands and the rough, rolling areas of Lauderdale soils in the northeastern part of the county. No atten-

tion, however, has been given to the selection of soils for particular crops further than that the well-drained sandy lands are used, where available, for sweet potatoes, and the moist depressions for sugar cane and sorghum. The heavy clay lands, such as the Montrose and Susquehanna clays, have generally been left in forest on farms where more friable and more easily worked soils are available. Cotton and corn have been grown on all the soils, even in the bottoms and on the clay uplands, without much regard for any particular soil adaptation to these crops or to varieties. The limy soils in the southwestern part of the county are recognized as being peculiarly adapted to grass and more of the land is used for hay and pasture and more stock is raised here than in other parts of the county. Generally the sandy soils have been selected for the small fields of peanuts that are grown for home use and for feeding hogs. It is recognized that the soils of the county are in general well adapted to the raising of stock, particularly beef cattle and hogs, as they provide good pastures of lespedeza and various nutritious native grasses and good crops of forage, such as velvet beans, soy beans, cowpeas, peanuts, and sorghum. Now that the cotton crop has suffered so severely from the boll weevil, farmers are turning to raising cattle and hogs and some to growing sweet potatoes and vegetables for market.

About the same methods are employed throughout the county in breaking land. One-horse implements are in general use and the soil is plowed, usually in the spring, to a depth seldom greater than 4 inches. Some farmers use 2-horse teams and heavy plows, particularly on the heavier soils in the southwestern part of the county. Cultivation is performed with light 1-horse plows, mostly of the shovel type. Some side harrows are used for cotton and corn. Most of the crops are grown on ridges. Cotton is generally given three or four shallow cultivations with plows and two to three with hand hoes. Corn is handled in the same way, but is generally given fewer plowings. Oats, which are grown in small fields by some farmers, are seeded broadcast in inadequately prepared ground. The crop is mostly fed in the sheaf to work stock. The farm buildings throughout the county are generally small, but sufficient to house the cotton and the corn and other crops that are generally not marketed as harvested.

Crops are seldom rotated with any definite idea of improving the soil. Cotton is often followed by corn, and vice versa, but this generally has been done simply to reduce the acreage of one of these crops. Under boll-weevil conditions there is a tendency to follow cotton with some other crop. An increasing number of farmers are growing cowpeas, velvet beans, soy beans, and lespedeza, both for the purpose of improving the soil and for the production of hay. Some

of the more progressive farmers are devoting large fields to velvet beans, which not only benefit the soil, but whose fruit is valuable as a feed for cattle. A few of the farmers grow winter wheat in a rotation with corn and cowpeas.

Fertilizers have been in common use on cotton for a long period. The quantity used increased annually up to the time of the advent of the boll weevil. Since then smaller quantities have been used. Occasionally corn is fertilized on upland farms. The applications range from 150 to 300 pounds per acre, and consist of a mixture of equal parts of cottonseed meal and acid phosphate, or of ready-mixed commercial brands analyzing about 8 to 10 per cent phosphoric acid, 1.65 to 2 per cent nitrogen, and 2 to 3 per cent potash. In the last two years potash has not been available. Fertilizers are ordinarily distributed in the drill and covered to a shallow depth a short time before the crops are planted. The small quantity of barnyard manure produced is usually carefully applied to cotton, corn, and other crops. Some farmers distribute one-third of the fertilizer when the seed is planted, one-third when the plants are 6 to 10 inches high, and one-third just before fruiting begins.

In raising cattle the animals are grazed throughout the entire year, but the better farmers feed some hay and occasionally some cottonseed meal during the winter months. Hogs also run in the open all the year. In some instances they are fed on corn for a short period just before killing or sale. A few carload lots of cattle and hogs are shipped, but very little dressed beef or pork is sold aside from the unimportant sales on the local markets. A few farmers in the southeastern part of the county use cream separators and sell some cream and milk on the Meridian market. The sale of butter is as yet unimportant. Chickens, turkeys, and eggs are the source of some income on a considerable number of farms.

Labor has been generally plentiful. Much of the farm labor is done by negro day laborers, who are paid about 75 cents a day, or by monthly wage hands, who receive \$12.50 to \$15 a month, with board. The sawmills employ much labor, paying from \$1 to \$2 a day for tree cutters and teamsters.

The farms in Newton County range from 1-horse farms, on which about 20 to 25 acres are cultivated, to farms operating in some instances as many as 15 to 20 plows and cultivating about 20 acres to the plow. According to the census of 1910, 61.1 per cent of the farms are operated by owners, 38.8 per cent by tenants, and 0.1 per cent by managers. Usually in renting land the tenant pays one 500-pound bale of cotton for the use of a 1-horse farm, or 75 cents to \$1.25 per acre. A good many tenants operate on a share basis, ordinarily receiving one-half the produce.

Land valuations range from about \$10 to \$30 an acre for the well-drained uplands, and average about \$5 or less in case of the rough, stony Lauderdale soils. Land that supports considerable merchantable timber is held at much higher prices than those stated above. Before the coming of the boll weevil the prices of farm land were much higher and the farmers were in a much better financial condition. It is likely that higher prices will be reached as stock raising develops and as the farmers readjust their cropping system to boll-weevil conditions and produce better yields of cotton by planting earlier varieties and giving more thorough cultivation.

SOILS.

The upland soils of Newton County are derived from sedimentary deposits of heavy clay, sandy clay, limestone, and the white siliceous rock belonging to what is geologically known as the Tallahatta buhrstone formation. The soils of the first and second bottoms consist of material washed down from the uplands and from the same or similar soils, in the case of the larger streams reaching beyond the limits of the county, spread out over the flood plains by overflow waters.

The sedimentary formations of the uplands are known as Coastal Plain deposits. They consist of materials which were transported by water from older land areas to the north and spread out southward over the Coastal border country under marine conditions. The limestone is made up of material which was deposited in water that was peculiarly favorable for the accumulation of lime-bearing materials, as the remains of sea shellfish. The other deposits, the beds of sandy clay and heavy clay, are lower in lime content and much higher in content of siliceous material, such as quartz sand particles. The soils derived from these siliceous beds are prevailingly much more sandy, especially in the surface soil, than those derived from limestone, yet there is considerable fine-textured or silty soil derived from these strata. The heavy clay beds have given rise to heavy clay soils, especially in the subsoil section, while the noncalcareous rocks of the Tallahatta buhrstone formation have weathered to a silty and clayey soil of a stony nature.

Through weathering these noncalcareous or highly siliceous beds have given rise to soils which differ markedly in color and to some extent in structure, owing apparently in large measure to differences in oxidation resulting from differences in drainage. The best drained soils are red and generally friable, while the more poorly drained types are gray and mottled gray and yellow and are more compact and plastic. The white, siliceous Tallahatta buhrstone formation has given a whitish soil corresponding to the color of the parent

rock. The limestone has largely weathered to clay. The original rock has decomposed by the removal of lime carbonate in solution, and the present soil represents the impurities in the original rocks, together with some lime.

There is some soil (Pheba silt loam) which may contain wind-blown material somewhat related to the loessial soils bordering the Mississippi River bottoms on the east side. There is no positive evidence, however, to determine the question of origin in this case.

The soils derived from limestone are confined to the southwestern part of the county and occupy undulating to level areas, while the other upland soils occupy the remainder of the county, although some of these noncalcareous soils are associated with the calcareous soils of the southwestern part. The whitish soils from the Tallahatta buhrstone, grouped with the Lauderdale series, are confined to rough areas in the northeast and east-central parts of the county. The country occupied by the other noncalcareous upland soils, which belong in the Ruston, Greenville, Orangeburg, and Susquehanna soils, is prevailingly rolling, while that occupied by the Pheba silt loam is nearly level.

Erosion has played a very important part in altering the topography and apparently removing the finer particles of the surficial material, there being many places in which the surface layer to a depth of a foot or more consists of very sandy or silty material, while the subsoil consists of clay. The remains of vegetation have accumulated in the soil and given it a darker color.

The first-bottom soils consist of alluvium of very recent deposition, and additional sediments are laid down at every overflow. The second-bottom soils are older and are no longer overflowed, as they were before the streams had cut down their channels to the present levels. The more poorly drained bottom soils are grayish and mottled grayish and yellowish, while the better drained ones are brownish. On the second bottoms the better drained soils have reddish or yellowish subsoils. In the southwestern part of the county, where some of the material has been washed from the calcareous upland soils of the Houston and Sumter series, the material is prevailingly calcareous, but elsewhere the alluvial soils are generally acid to litmus paper.

For the purpose of mapping soils are grouped in series on the basis of similarity in origin, color, topography, and drainage, the members of the series differing from one another mainly in texture or the relative proportion of coarse and fine material which they contain. In all 16 series, embracing 25 soil types, are mapped in Newton County. In the following paragraphs the more distinctive features of the several series are brought out.

Of the well-drained upland soils derived from Coastal Plain deposits three series, the Orangeburg, Ruston, and Greenville, differ from one another mainly in color. The types of the Orangeburg series have grayish surface soils and red, friable subsoils; those of the Ruston series have grayish surface soils and dull-red or yellowish-red, friable subsoils faintly mottled in places; and those of the Greenville series have reddish-brown surface soils and red, friable subsoils. The soils of these three series are derived from the more sandy deposits and are low in lime. The Orangeburg series is represented in Newton County by the sand, fine sandy loam, and very fine sandy loam; the Ruston series by the fine sandy loam, very fine sandy loam, and silt loam; and the Greenville series by the silt loam and clay loam.

The soils of the Susquehanna series are derived from heavy clay beds of Coastal Plain origin. They have grayish to light-brownish surface soils and heavy, plastic clay subsoils, mottled red and drab, and are usually low in content of lime. The Susquehanna series is represented in Newton County by two types, the fine sandy loam and very fine sandy loam.

The Pheba series includes types having light-brownish surface soils, yellow, friable upper subsoils, and mottled yellowish and grayish, compact lower subsoils containing considerable dark-colored concretions or concretionary material. These soils are also low in content of lime. The silt loam is the only type of this series mapped in Newton County.

The surface soils of the Montrose series are grayish to brownish and are underlain by extremely sticky, plastic, yellow clay subsoils, usually containing pale-yellow, gray, and drab mottlings in the lower part. The subsoil is somewhat similar to that of the Sumter clay, but unlike the latter, it contains no lime concretions and is low in lime content. It is also somewhat similar to the subsoil of the Susquehanna series, but contains much less red mottling and is more sticky. Another distinguishing feature of this series is the low hummocks and slight depressions which mark the surface, giving rise to the local name of "hog-wallow land." In the depressions the soil is darker in color than on the hummocks. The Montrose series is represented by two types, the silt loam and clay.

The Lauderdale series includes grayish surface soils and pale-yellow to whitish, fairly stiff to friable subsoils. Fragments of the whitish parent rock are plentiful and the bedrock is usually reached within the 3-foot section. The Lauderdale soils have a rough topography, are well drained, and have a low lime content. The Lauderdale stony loam, the only type mapped in this series, is extensively associated with patchy areas of the Ruston and Susquehanna soils.

The Houston and Sumter soils are derived from limestone or chalky limestone and are high in content of lime. The types of the Houston series have ashy-brown to ashy-black surface soils and greenish-yellow, rather plastic subsoils, while those of the Sumter series have brown to yellowish-brown surface soils and greenish-yellow, plastic subsoils. The soils of both these series are well drained except in some flat areas. The Houston clay and the Sumter clay, the latter with a flat phase, are mapped in Newton County.

The Oktibbeha series includes types having light-brownish surface soils, underlain by dull-red or brownish-red clay subsoils, changing to plastic clay, mottled red and drab in the lower part. The subsoil of this series is very similar to that of the Susquehanna series in both color and structure, but the Oktibbeha clay apparently contains more lime, as it tends to crumble more on exposure to the air. In Newton County the Oktibbeha sandy loam and clay are mapped.

The Ochlockonee and Bibb series include first-bottom alluvial soils derived from material washed from noncalcareous upland soils, including those of the Orangeburg, Ruston, Greenville, and Susquehanna series. The surface soils of the Ochlockonee series are brown, and are underlain by light-brown to yellowish subsoils, frequently mottled with gray in the lower part, while the Bibb soils are gray or mottled gray and yellowish in both the surface soil and subsoil and frequently contain concretions, the lower subsoil or substratum being compact and somewhat impervious. The content of lime is low in both series. The Ochlockonee soils are mellow and between overflows have good drainage, while the Bibb soils are more compact and are poorly drained between overflows.

The Ochlockonee series is represented in Newton County by one type, the loam, and the Bibb series by two types, the fine sandy loam and loam.

The Trinity series includes first-bottom soils. The surface soils are brown to black and the subsoils are yellowish brown. These soils include enough wash from calcareous uplands to give them a relatively high content of lime. The clay is the only type of this series mapped in Newton County.

The second-bottom soils are embraced in three series, the Myatt, Cahaba, and Kalmia, and are formed of material derived from the same source as that giving rise to the Ochlockonee and Bibb soils. The Myatt series includes the poorest drained and the Cahaba the best drained of these second-bottom soils. The Kalmia soils occupy an intermediate position between the Myatt and Cahaba soils in point of drainage. The soils of the Myatt series differ from those of the Bibb series in that they occur on terraces and are not subject to overflows. The Cahaba series is characterized by the light-brownish color of the surface soils and the dull-red color and friable structure

of the subsoils. The surface soils of the Kalmia series are grayish, while the subsoils are yellow and friable and frequently contain grayish mottlings in the lower part. Each of these three series is represented in Newton County by one type, the Cahaba by a fine sandy loam and the Myatt and Kalmia by a very fine sandy loam.

In the succeeding chapters the several soil types mapped are described in detail and their relationship to the agriculture of the county is brought out. The following table gives the names and extent of the different soil types:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Ruston fine sandy loam.....	60,544	16.3	Ruston silt loam.....	5,184	1.4
Ruston very fine sandy loam....	50,560	13.6	Oktibbeha sandy loam.....	5,120	1.4
Orangeburg fine sandy loam.....	40,960	11.1	Orangeburg very fine sandy loam.....	5,056	1.4
Ochlockonee loam.....	35,840	9.7	Cahaba fine sandy loam.....	4,800	1.3
Bibb fine sandy loam.....	28,800	7.8	Houston clay.....	4,736	1.3
Susquehanna very fine sandy loam.....	27,520	7.4	Greenville silt loam.....	4,160	1.1
Kalmia very fine sandy loam....	17,600	4.8	Myatt very fine sandy loam....	3,392	.9
Montrose clay.....	17,408	4.7	Sumter clay.....	1,280	.8
Susquehanna fine sandy loam....	16,064	4.3	Flat phase.....	1,728	
Bibb loam.....	8,704	2.3	Oktibbeha clay.....	2,304	.6
Lauderdale stony loam.....	7,872	2.1	Orangeburg sand.....	1,664	.5
Pheba silt loam.....	7,424	2.0	Montrose silt loam.....	832	.2
Trinity clay.....	5,632	1.5	Total.....	370,560
Greenville clay loam.....	5,376	1.5			

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam consists of a light-gray fine sandy loam, low in organic matter, changing at about 5 or 6 inches to a pale-yellow fine sand or loamy fine sand, which is underlain at depths ranging from 12 to 24 inches by a dull-red or yellowish-red, friable sandy clay. Frequently the subsoil is somewhat mottled with yellow and in the lower part with gray. Where the gray mottling is present the subsoil material is usually more compact than elsewhere and the color is yellower. In places the type resembles the Susquehanna fine sandy loam, the lower subsoil being stiffer and more mottled than usual. On the slopes spots occur in which the subsoil comes near the surface or is exposed as a result of erosion. Numerous areas of Susquehanna fine sandy loam and very fine sandy loam and of Orangeburg fine sandy loam too small to indicate on the map are included with the Ruston fine sandy loam.

This type is widely distributed throughout the uplands in the central and eastern parts of the county, being most extensive northwest of Newton and in the vicinity of Chapel Hill School. The surface

is characteristically rolling and is in the main favorable to cultivation, although some of the slopes are too steep for safe cultivation without terracing. There are but few gulches or gullies. Drainage is very good and the soil holds moisture satisfactorily.

The Ruston fine sandy loam is the most extensive soil type in the county. It is important agriculturally, and probably 40 to 50 per cent of it is under cultivation. The remainder is largely forested with second-growth pine and virgin longleaf pine. A part consists of cut-over land. On some of the rougher areas the ridges support a growth of pine, with scattered oak and an occasional hickory.

Cotton is the principal crop. Generally enough corn is grown for the work stock and occasionally some is sold. Sweet potatoes and watermelons are grown on nearly every farm for home use and for sale locally. Oats and peanuts are grown to a small extent, and patches of sugar cane are planted, mainly for the home supply of sirup. Some beef cattle are pastured on the timbered cut-over areas, as well as in cultivated fields.

This is an early soil, cotton reaching maturity a week or two earlier than on the heavier and more poorly drained types.

Cotton yields ordinarily from one-fourth to one-half bale per acre, with only small additions of fertilizer or manure. Before the advent of the boll weevil, with careful cultivation and the use of fertilizer, as much as a bale per acre was obtained. Corn yields range ordinarily from 10 to 25 bushels per acre, depending largely upon the season.¹

The soil usually is plowed to a depth of not more than 4 inches and frequent shallow cultivations are given. Light 1-horse plows are in general use. Before 1916 commercial fertilizer, consisting for the most part of equal proportions of phosphate and cottonseed meal, was used by a considerable number of farmers on this type in applications of 150 to 300 pounds per acre, but very little has been used since then.

Farm land of the Ruston fine sandy loam can be bought for about \$10 to \$20 an acre, depending upon location. These prices are considerably lower than prevailed before the advent of the boll weevil. Land supporting a good growth of commercial pine is held for as much as \$50 to \$75 an acre.

For the improvement of this type it is necessary to add organic matter, which can be done by plowing under such leguminous crops as velvet beans, cowpeas, and soy beans, all of which do well. Deeper and earlier plowing is also beneficial, especially in preparing the land for corn. Peanuts could be profitably grown on a larger scale as a field forage crop for hogs.

¹ The yields given in this report are based on information obtained from farmers.

RUSTON VERY FINE SANDY LOAM.

The Ruston very fine sandy loam differs from the Ruston fine sandy loam chiefly in its finer texture and more compact structure. In mapping some patches of Greenville clay loam, Susquehanna fine sandy loam and very fine sandy loam, and Ruston fine sandy loam were included on account of their small size.

The type has the same character of topography and drainage and about the same working qualities as the Ruston fine sandy loam.

In extent the Ruston very fine sandy loam ranks second among the soils of Newton County. Its largest development is in the vicinity of Scanlon and west of Union.

Agriculturally this type is about equal in importance to the Ruston fine sandy loam. It is used for the same crops as the latter type, produces similar yields, and responds to the same methods of improvement.

RUSTON SILT LOAM.

The surface soil of the Ruston silt loam consists of a light-brown or grayish-brown silt loam, changing at 5 or 6 inches to a pale-yellow silt loam, which extends to a depth of 8 to 12 inches. The subsoil consists of a dull-red silty clay loam, passing abruptly into a dull-red, friable silty clay. Usually the subsoil of this type contains less sand and more silt than the subsoils of the sandy members of the Ruston series, and is not quite so friable, but frequently there is little difference either in texture or structure. In places the lower subsoil is somewhat mottled with yellow.

The Ruston silt loam is not an extensive type. It occurs in scattered patches throughout the northern and western parts of the county. Some of the largest areas are found in the vicinity of Union, south of Macedonia Church, northeast of Union Ridge School, at Pleasant Valley Church, and Pine Grove School.

The topography is prevailingly gently rolling to rolling. Occasionally the tops of ridges are level or nearly so. All the type is topographically well suited to agriculture.

The drainage in most cases is good, but in some of the flatter areas small sinks or poorly drained depressions occur.

This type is recognized as a very good soil for general farming, and about 50 per cent of it is in cultivation. A part of it still supports a growth of pine. The principal crops are corn, cotton, and oats, the last named being the least important of the three. Corn and cotton are grown to about an equal extent. Cotton is the principal money crop. A large part of the corn and oats is used to feed the work stock, though occasionally some corn is sold at local markets. The raising of beef cattle and hogs is not of very much

importance on this type. Most of the farmers keep one to three cows and about the same number of hogs.

Corn ordinarily yields 12 to 25 bushels per acre. Before the advent of the boll weevil cotton yields ranged from one-fourth to 1 bale per acre, but at present they are much lower. Fall-seeded oats yield from 15 to 25 bushels per acre.

The Ruston silt loam is easily tilled and does not clod or bake on drying. It responds readily to methods of improvement, including fertilization.

Land of this type is valued somewhat more highly than the Ruston fine sandy loam and very fine sandy loam.

For the highest development of this type it is necessary to plow deeply and to incorporate as much vegetable matter as practicable. Planting velvet beans between the corn rows has been found to be very beneficial.

In the following table are given the results of mechanical analyses of samples of the soil and subsoil of the Ruston silt loam:

Mechanical analyses of Ruston silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423603.....	Soil, 0 to 10 inches.	0.4	1.4	1.4	6.4	6.6	75.1	8.5
423604.....	Subsoil, 10 to 36 inches.....	.1	.9	1.0	5.1	5.4	58.4	29.4

ORANGEBURG SAND.

The Orangeburg sand consists of a gray, loose sand, passing into a red, slightly loamy sand, which extends to a depth of 3 feet or more with practically no change in texture. There are some included spots of Ruston sand, in which the subsoil is only slightly reddish. The type also includes some patches of very fine sand, fine sand, and medium sand.

This type occurs in the vicinity of Stamper, Poplar Springs Church, Wickware, and Pine Grove School, occupying gentle hill slopes and the tops of some of the high, winding ridges. The surface is generally rolling to hilly. Some areas resemble sand dunes, and apparently the wind has played an important part in their surface configuration. Owing to the deep, open structure of the type, drainage is excessive.

The Orangeburg sand is of very little agricultural importance. It embraces only a few square miles, and a very small percentage of this is under cultivation. Most of the type supports a light growth of scrubby blackjack and post oak and a few scattered pines. The pine generally is rather stunted and of little commercial value.

This type is well adapted to the production of early vegetables. Watermelons, cowpeas, peanuts, and some sweet potatoes are grown.

Peanuts make an average yield of about 20 bushels to the acre. They find a ready market in the county.

It is difficult to estimate the average value of this type. It is considered a very poor soil, and in some cases can be bought for as little as \$3 an acre.

In order to obtain the best results with this soil it is necessary to add considerable organic matter, either barnyard manure or green-manure crops, in addition to commercial fertilizer. An efficient way of improving the soil is to grow velvet beans and leave them for cattle to forage upon in the fall and winter.

ORANGEBURG FINE SANDY LOAM.

The Orangeburg fine sandy loam consists of a grayish fine sand, passing at 5 or 6 inches into a light-gray or yellowish, loamy fine sand to fine sandy loam, which is underlain at a depth of about 8 to 15 inches by a red, friable sandy clay.

This type has a rather patchy distribution throughout all sections of Newton County. It is extensively developed in the southeastern corner of the county, north of Chunky and west of Algood Creek. Other areas of importance occur north of Doolittle, north of Stratton, and in the vicinity of Newton and Sweetwater School. The topography varies considerably, the type occupying level to gently rolling uplands, the crests of narrow, winding ridges with steep flanking slopes, the gentler slopes of stream valleys, and broken uplands. Drainage in all cases is good.

The Orangeburg fine sandy loam is considered a very important soil type. About 65 per cent of it is under cultivation or is used as pasture land. The remainder is forested with shortleaf and longleaf pine or consists of recently cut over land.

Cotton, corn, oats, velvet beans, and cowpeas are the principal crops. Cotton leads in acreage. The soil warms up early in the spring, thus allowing the cotton to be planted at least two weeks earlier than on the low-lying more poorly drained soils. Sedge grass and lespedeza seem to thrive on this type, and quite a few cattle are pastured. Nearly every farmer keeps from 1 to 4 milch cows, most of the milk and butter being consumed on the farm.

Cotton yields ordinarily from one-fourth to 1 bale and corn from 10 to 25 bushels per acre. In exceptional cases as much as 75 to 100 bushels of corn per acre has been obtained.

The Orangeburg fine sandy loam is handled and fertilized very much like the Ruston soils. Barnyard manure is used wherever available. A fertilizer containing equal proportions of cottonseed

meal and phosphoric acid is commonly used. Many farmers supply nitrogen and organic matter to the soil by planting cowpeas and velvet beans between the corn rows.

The price of land of this type ranges from \$8 to \$35 an acre, depending upon the location, improvements, and topography.

The Orangeburg fine sandy loam can be used to produce a great variety of crops. It is a good soil for vegetables, including potatoes and melons, and under proper economic conditions some of it could be used for such crops. The Elberta peach does well on it. Much of the type has been allowed to wash and gully badly. Hillside terraces have been badly neglected and many fields are being ruined by preventable gullying. Deeper plowing should be practiced; winter cover crops, such as oats and rye, should be more extensively grown, and terraces should be carefully maintained in all sloping cultivated fields.

ORANGEBURG VERY FINE SANDY LOAM.

The surface soil of the Orangeburg very fine sandy loam consists of a light-gray very fine sandy loam which either shows little change downward to the subsoil or passes into a pale-yellow to reddish very fine sandy loam. The subsoil, beginning at a depth of about 15 to 24 inches, is a red, friable, sandy clay. A variation of this type occurs in which the subsoil is noticeably stiffer than usual, apparently owing to a lower content of sand. This variation in some respects resembles the Susquehanna very fine sandy loam, but is more friable and does not show any mottling.

The Orangeburg very fine sandy loam is not extensive. It occurs as scattered patches throughout the northern half of the county, some of the largest bodies lying in the vicinity of Union Ridge School, Spring Hill Church, and north and south of Rock Creek Church. The type occupies high, winding ridges, which are for the most part flat on top but have steep, broken slopes. Drainage in all cases is good.

Owing to its small extent, this is not considered a very important soil type, although about 75 per cent of its total area is under cultivation.

The same crops are grown as on the Orangeburg fine sandy loam, namely, cotton, corn, oats, velvet beans, and cowpeas. The yields are probably slightly higher than on the latter type.

There is very little difference in the price of lands of the Orangeburg fine sandy loam and very fine sandy loam. The methods of improvement followed on the former are applicable to the latter.

The results of the mechanical analyses of samples of the soil and subsoil of the Orangeburg very fine sandy loam are given in the table following:

Mechanical analyses of Orangeburg very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423624.....	Soil, 0 to 10 inches.	0.2	4.6	6.0	41.6	4.8	37.8	4.9
423625.....	Subsoil, 10 to 36 inches.....	.2	3.2	4.6	44.0	3.8	19.6	24.8

SUSQUEHANNA FINE SANDY LOAM.

The Susquehanna fine sandy loam consists of a grayish fine sandy loam 6 to 10 inches deep, underlain by a red or dull-red, heavy, plastic clay, usually mottled with gray in the lower part of the 3-foot section.

This type is not so extensively developed as the Susquehanna very fine sandy loam. Some of the more important areas are located at Sand Springs Church, in the vicinity of St. Mary Church, and north of Hickman Chapel School. The topography is similar to that of the Susquehanna very fine sandy loam, and the drainage is somewhat better.

Owing to the similarity of the two soils, the same crops are grown and the same methods of cultivation and fertilization practiced on the Susquehanna fine sandy loam as on the very fine sandy loam.

Farms on this type sell at about \$5 to \$25 an acre. For the improvement of the soil the same treatment is required as for the Susquehanna very fine sandy loam.

SUSQUEHANNA VERY FINE SANDY LOAM.

The surface soil of the typical Susquehanna very fine sandy loam is a light-brown to grayish-brown very fine sandy loam, passing into a pale-yellow very fine sandy loam, which extends to a depth of about 6 to 15 inches. The subsoil is a stiff, red clay, which in the lower part is very plastic and mottled with drab and gray and sometimes with yellow. In places the mottled, plastic clay lies very close to the surface. There are also a good many places, especially in the low-lying or nearly level areas, in which the subsoil is yellowish or reddish yellow in the upper part and contains more yellowish mottling than is characteristic of the rolling areas. As mapped this type includes some small areas of the Ruston and Orangeburg very fine sandy loams.

The Susquehanna very fine sandy loam has a patchy distribution throughout the county. It is extensively developed in the north-west township, near Prospect, and in the vicinity of St. Paul School, south of Bollybusha Creek, and east of Doolittle School. The to-

pography varies from nearly level to rolling and hilly. Surface drainage is in most cases good, but the underdrainage is retarded to some extent by the dense subsoil. The type becomes saturated after heavy rains, causing roads passing through it to be very muddy and sticky.

The Susquehanna very fine sandy loam, owing to its wide distribution, is a rather important soil type. Only about 40 to 50 per cent of it is under cultivation. Extensive areas are lying idle, while some large areas still support a dense forest growth consisting of oak and longleaf and shortleaf pine.

Cotton and corn are the principal crops, the former occupying the larger area. A few of the low-lying areas are planted in sorghum and sugar cane, producing fair yields. Some of the fields support a luxuriant growth of sedge grass, lespedeza, and other wild grasses which are used for hay. Large tracts are utilized as pasture, mainly for beef cattle.

Cotton, where not damaged severely by the weevil, yields about one-fourth to three-fourths bale per acre and corn from 10 to 25 bushels per acre.

Where the stiff clay subsoil is within reach of the plow cultivation is not as easy as on the Orangeburg and Ruston soils, especially under excess moisture conditions. Fields plowed when too wet or too dry clod badly, and considerable difficulty is encountered in obtaining a good seed bed. Very little commercial fertilizer is used on this type. Barnyard manure is used where available.

Land of the Susquehanna very fine sandy loam can be bought for about \$5 to \$25 an acre, depending upon location, improvements, and topography.

For best results with this type deep fall plowing should be more extensively practiced, and winter cover crops, such as oats and rye, should be grown. The growing of velvet beans and cowpeas between the corn rows benefits the soil by increasing the supply of nitrogen and organic matter and preventing it from becoming compact. Washing and gullyng, which are severe in places, especially where the type borders streams, should be stopped by growing soil-binding grasses such as Bermuda and lespedeza and by constructing permanent terraces on all cultivated slopes.

GREENVILLE SILT LOAM.

The Greenville silt loam is a brown to reddish-brown silt loam, underlain at about 8 to 12 inches by a deep-red clay of moderately friable structure. Seams and fragments of ironstone are present, just as in the clay loam. As mapped there are included small areas of Ruston and Orangeburg fine sandy loam and Greenville clay loam.

The Greenville silt loam has a rather patchy distribution throughout the north-central and south-central parts of the county. The most extensive areas occur in the vicinity of Beulah Church and Beulah School, along the New Orleans, Mobile & Chicago Railroad south of Union, and southeast of Midway Church. The topography ranges from level to gently rolling, being somewhat smoother than that of the clay loam type of this series. For the most part the type occupies the smooth tops of ridges. Drainage is well established.

About 90 per cent of this type is cultivated. Owing to its small extent it is of only moderate importance agriculturally.

Like the Greenville clay loam, the type is chiefly used for the production of cotton, corn, cowpeas, oats, and velvet beans. Stock raising is not carried on to an important extent. Yields are slightly higher than on the clay loam. Owing to its loose, silty nature, the soil is easily handled and can be plowed under a wider range of moisture conditions than the clay loam type.

Moderate applications of commercial fertilizer, usually mixtures of cottonseed meal and acid phosphate, are made by quite a number of farmers.

Land of the Greenville silt loam sells at about \$20 to \$50 an acre, depending upon location and improvements.

For the best development of this type leguminous crops, especially velvet beans and cowpeas, as well as winter cover crops, should be more extensively grown.

The results of the mechanical analyses of samples of the soil and subsoil of the Greenville silt loam are given in the following table:

Mechanical analyses of Greenville silt loam.

Number	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423613.....	Soil, 0 to 10 inches.	0.6	2.6	2.0	12.0	6.6	61.4	14.0
423614.....	Subsoil, 10 to 36 inches.....	.1	1.6	1.5	7.5	6.7	52.7	29.7

GREENVILLE CLAY LOAM.

The typical Greenville clay loam consists of a reddish-brown to dark-red clay loam or sandy clay loam, underlain at about 4 to 8 inches by a deep-red, moderately friable clay. Frequently there is some limonite-yellow or greenish-yellow, ferruginous material in the subsoil. Thin seams of reddish-brown ironstone are of common occurrence in the surface soil, being in some areas abundant enough to make the soil decidedly gravelly. Hollow nodules of ferruginous

rock are also present in places. The type as mapped includes some small areas of Orangeburg fine sandy loam and Greenville silt loam.

The Greenville clay loam is confined to the north-central part of the county. Some of the largest and most typical areas are located at Union, east of Union along the Neoshoba County line, at Rock Branch Church, and at Mount Hebron Church. It generally occupies ridges and stream slopes, and the topography is rolling to gently rolling. Drainage is well developed, there being only a very few poorly drained depressions.

The Greenville clay loam, although occupying a total area of only about 7 square miles, is considered a very important type. It is locally called "red land." About 85 per cent of it is under cultivation. Some of the best farms in the county are located on this type.

Cotton, corn, oats, velvet beans, cowpeas, and lespedeza hay are the principal crops. Corn probably leads in acreage, being closely followed by cotton.

Cotton is the chief money crop. Occasionally some corn is marketed, but as a rule all corn, cowpeas, and velvet beans are fed to the hogs, cattle, and work stock on the farm. Stock raising and dairying are practiced to only a very small extent.

The Greenville clay loam is a very desirable type for general farming. It is generally too late for truck crops, and is not a desirable soil for sorghum and sugar cane, as the sirup produced has a rather dark color.

Corn yields about 12 to 35 bushels, and cotton, where not damaged by the boll weevil, from one-half to 1 bale per acre. Fall-sown oats yield from 15 to 30 bushels per acre.

The Greenville clay loam is a heavy soil, and can be plowed only under a narrow range of moisture conditions. If plowed when too wet it clods badly, and much difficulty is subsequently encountered in preparing the seed bed.

Farms located on the Greenville clay loam sell at about \$15 to \$50 an acre, depending upon location and improvements.

For the best development of this type it probably should be plowed deeply in the fall and moderately shallow in the spring. A good, mellow seed bed should be obtained before planting. Heavy 2-horse plows should be used instead of the prevailing 1-horse plows. Winter cover crops such as oats, rye, and vetch should be more extensively grown, and velvet beans, soy beans, and cowpeas should be planted between the corn rows in order to increase the supply of organic matter and nitrogen. The type responds readily to commercial fertilizers and is especially susceptible to improvement by the incorporation of barnyard manure, light applications of the latter producing highly beneficial and lasting results.

PHEBA SILT LOAM.

The surface soil of the Pheba silt loam is a gray silt loam, changing at about 5 inches to a pale-yellow silt loam, which extends to a depth of about 8 to 12 inches. The subsoil is a yellow, friable silty clay or fine sandy clay, which is noticeably compact in the lower part and contains yellowish-brown and gray mottlings and numerous black concretions. The type closely resembles the Norfolk silt loam, except in its compact, mottled subsoil. On the slopes the surface soil is usually shallower than elsewhere and frequently ranges up to a fine sandy loam in texture.

This type is developed in rather small, scattered areas. It is fairly extensive in the vicinity of Hazel, Patrons Union, south of Conehatta, south of Bethel, north of Hickory, southwest of New Island Church, and southeast of Pierce Store, along the Jasper County line. The surface is level to gently sloping, and the drainage in most cases is good, although the compact substratum probably impedes internal circulation of moisture.

The Pheba silt loam is considered a rather important agricultural soil. About 75 per cent of its total area is under cultivation.

Cotton, corn, oats, velvet beans, sorghum, sugar cane, sweet potatoes, and lespedeza are the principal crops. Corn probably leads in acreage. A few beef cattle and dairy cows are pastured on the type in the vicinity of Hazel and Conehatta.

Corn yields about 10 to 25 bushels, cotton one-fourth to 1 bale, oats 15 to 30 bushels, and sugar cane 200 to 500 gallons of sirup to the acre.

The type is handled in practically the same manner as the other upland soils. If plowed when wet clods are formed, but under proper moisture conditions the soil works up into a loose, desirable seed bed. It is considered a very good soil for general farming. Commercial fertilizers, chiefly those containing nitrogen and phosphoric acid, are used to a small extent. Barnyard manure is used where available.

Land of the Pheba silt loam sells at about \$8 to \$25 an acre, depending upon location and improvements. Considerable areas of this type are deficient in organic matter, and for their improvement a rotation including a leguminous crop to be turned under is highly recommended. Owing to the compact substratum and consequent poor circulation of air and water, deep fall plowing is advisable.

LAUDERDALE STONY LOAM.

The Lauderdale stony loam is a grayish to yellowish-brown silt loam to silty clay loam, grading beneath into yellow, greenish-

yellow, or whitish clay. The surface soil for an inch or two is usually darker than the rest of the material owing to the presence of vegetable matter. The underlying whitish to yellowish soft rock from which this type is derived is nearly always reached within the 3-foot section, and fragments of it are present throughout the soil section. As mapped the type includes many areas of Susquehanna and Ruston soils which could not be satisfactorily separated owing to their small size. In many places the surface soil, and often the upper subsoil, consist of Ruston or Susquehanna material and the lower subsoil of Lauderdale material.

This type occurs in the extreme eastern part of the county. The topography is rolling to rough, there being many sharp, winding ridges flanked by steep slopes. Drainage is well established.

While this is an extensive type it is not important agriculturally, its uneven surface and stony nature rendering it unsuitable for cultivation. Nearly all of it is either forest or cut-over land. A few small areas here and there, especially on the smooth slopes, as well as some of the included small areas of Susquehanna and Ruston soils, could be farmed, but the chief value of the type is for forest and pasture land. Cut-over land can be bought at \$5 or less an acre, forested land selling at a much higher price.

There are a number of native grasses and plants that afford fair to good grazing, although there is very little stock kept on the type. Beef cattle, hogs, and sheep, undoubtedly could be raised successfully. There are a few oak and hickory trees, which would afford some mast for hogs.

MONTROSE SILT LOAM.

The Montrose silt loam consists of a grayish to ashy-gray silt loam, underlain abruptly at about 8 to 10 inches by a yellow clay, faintly mottled with gray and yellowish brown. The lower subsoil is pale yellow. The surface soil compacts on drying and the subsoil is extremely sticky when wet. Neither surface soil nor subsoil is calcareous, and lime nodules are not present.

This type is typically developed in the southwestern prairie section of the county, bordering Tallahala Creek, and near Tanglewood. The topography is level to gently sloping and drainage for the most part is only fairly well established.

The Montrose silt loam is inextensive, and therefore is not considered an important agricultural soil. Only about 20 per cent of it is in cultivation, the remainder being forested with longleaf and shortleaf pine, post oak, blackjack oak, and some hickory.

Cotton is the most important crop. In the few small patches of corn grown the yields are low. A few cattle are pastured on the

forested areas, but owing to the dense growth and the small number of clearings, wild grasses make only a sparse growth.

Under the best conditions cotton yields one-third to one-half bale per acre, and corn 10 to 15 bushels per acre. The soil is handled very much like the Montrose clay, and no fertilizers of any kind are used.

Land of this type could probably be purchased at about \$5 to \$12 an acre.

The Montrose silt loam is an acid soil. It supports a good growth of lespedeza in clearings, and for its best development should be cleared and used as pasture land.

Mechanical analyses of samples of the soil and subsoil of the Montrose silt loam resulted as follows:

Mechanical analyses of Montrose silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423644.....	Soil, 0 to 10 inches.	3.0	8.6	7.0	7.8	3.2	61.0	9.3
423645.....	Subsoil, 10 to 36 inches.....	1.5	8.8	7.2	8.4	3.2	40.8	29.9

MONTROSE CLAY.

The Montrose clay consists of a brownish clay, underlain at about 1 to 3 inches by a yellow, extremely sticky, plastic clay, which in the lower part becomes pale yellow, with gray and in many places faint reddish mottlings. In the slight depressions the surface soil is dark brown to nearly black to a depth of 4 or 5 inches. The subsoil of this type is one of the stickiest clays known, being stickier than the subsoils of the Houston, Susquehanna, and Sumter series. This type differs from the Sumter clay mainly in being noncalcareous and free from lime nodules, and in showing more mottlings in the lower part. The subsoil is very much less red than the Susquehanna subsoil.

The Montrose clay is typically developed in the southwestern prairie section of the county. It occurs in broad, continuous belts in the vicinity of Tallahala school, north of Roberts, and along the Alabama & Vicksburg Railroad west of Lawrence. It occupies level areas, but has what is known as a "hog-wallow" surface, being characterized by low hummocks and shallow depressions. In wet seasons the drainage is poor and crops suffer, water standing on the surface after heavy rains, especially in the depressions. The streams through this type have shallow, winding channels, are sluggish, and therefore remove the drainage waters slowly.

The Montrose clay, owing to its rather wide distribution, is considered an important type. Probably about 35 per cent of its area

is cultivated or used as pasture land, the remainder being forested with shortleaf and longleaf pine, oak, and hickory. The oaks have a characteristic tall and open form of growth. All the trees have very short taproots, and many trees are blown over in storms, leaving shallow depressions which resemble the "hog wallows" that give rise to the local name of "hog-wallow" land.

Cotton, corn, and cowpeas are the principal crops. Cotton probably leads in acreage. Lespedeza, hop clover, and broom sedge seem to do well and afford good grazing. Most of the cleared land is in pasture, which is used almost exclusively for beef cattle.

Nearly all the hay and corn grown on this type is fed to live stock on the farm, little, if any, being sold.

The Montrose clay is not a very strong soil. It is productive when first cleared, but the yields soon decline. Corn yields ordinarily about 10 to 20 bushels per acre, and cotton one-fourth to three-fourths bale, under the best conditions. Hay yields vary with the amount of rainfall, being smaller in dry than in wet years.

Cultivation is restricted to a very narrow range of moisture conditions, the soil being too sticky to plow when moderately wet and too compact when dry. Barnyard manure is applied in small quantities where available. No commercial fertilizer is used.

The price of farm land of the Montrose clay ranges from \$3 to \$10 an acre. Where merchantable timber is still standing the prices are higher. Land accessible to improved roads is considered of more value than where only the ordinary dirt roads exist.

This soil is acid to litmus, suggesting need of lime. Very little grass grows in the forested areas of this type, and for the best results with pasture land all timber and brush should be cleared away. Where cotton and corn are to be planted it is advisable that the land be broken deeply in the fall. A more extensive growing of velvet beans and cowpeas and the turning under of these and other green-manure crops is highly recommended.

HOUSTON CLAY.

The Houston clay consists of a dark-brown to grayish-black clay which grades through a lighter brown into a greenish-yellow clay containing lime nodules. The subsoil resembles that of the Sumter clay. The type is calcareous throughout, and in places whitish, chalky, highly calcareous material is reached in the lower subsoil. The surface is very sticky when wet, but crumbles on drying. On some of the lower slopes and in flat areas the soil is blacker and deeper than usual. As mapped there are included areas of Sumter clay and Oktibbeha clay.

The Houston clay is a prairie soil and is confined to the southwestern corner of the county. It occupies gentle slopes bordering streams and level to gently rolling areas at the heads of streams. The topography is for the most part rolling to undulating, and surface drainage, except in small areas about the heads of streams, is uniformly good.

This type is inextensive but about 90 per cent of it is either in cultivation or is used as pasture land. A few small patches support a growth of oak, hackberry, hawthorn, and wild plum.

Cotton, corn, velvet beans, and soy beans are the principal crops. Alfalfa and melilotus are grown to a small extent. The prospect for an extension of alfalfa production in Newton County is most promising on this soil and its associated type, the Sumter clay. Cotton was formerly the leading crop, but owing to the prevalence of the boll weevil it is now surpassed by corn and hay. At present a considerable area of this type is fenced and used for pasturing beef cattle. Very few dairy cows are kept on it. About 95 per cent of the corn and hay produced is fed to cattle or work stock on the farms. The cattle when fat are shipped to New Orleans, St. Louis, and Chicago.

Corn yields about 12 to 25 bushels and cotton, under good conditions and when not injured by the boll weevil, from one-fourth to 1 bale per acre. Alfalfa and melilotus yield from 1 to 3 tons of hay per acre per season.

Some of the more progressive farmers on this type use up-to-date 2-horse implements, but the 1-horse plow is still in use on a large number of farms. No commercial fertilizer is used.

Land of the Houston clay can be bought at about \$12 to \$25 an acre, depending upon improvements.

The growing of legumes will supply organic matter and prove otherwise beneficial to the long used fields on this type. Where alfalfa is to be grown a pulverulent seed bed should be obtained by repeated harrowing and the soil inoculated by the addition of soil from an old alfalfa or melilotus field at the rate of 500 to 600 pounds to the acre. The Houston clay is well suited to such winter pasture crops as rye, oats, rape, and vetch.

SUMTER CLAY.

The Sumter clay consists of a brown to yellowish-brown clay, usually having a faint greenish cast, which passes at 5 or 6 inches into a yellow or greenish-yellow clay. There are usually present in the subsoil whitish nodules of lime, and in places an abundance of fossil shells. Both soil and subsoil are calcareous. At depths ranging from 3 to 5 feet there is a substratum consisting of whitish, chalky,

calcareous material. In many small patches this material is encountered within the 3-foot section, and in places within a foot of the surface. These shallow areas are less productive than the typical soil. The type is locally known as "shell prairie."

The Sumter clay is confined to the southwestern prairie section of the county. It has a rather patchy occurrence, the largest areas occupying the slopes along Quarterliah and Sunflower Creeks. The topography in most cases is undulating or gently rolling, the slope being steep enough to insure good drainage.

The type, although of small extent, is considered a rather important soil. Nearly the whole of it is in cultivation or is used as hay and pasture land.

It is a very good soil for general farming, but is of little value for vegetables or fruit. Some areas have been under cultivation for 50 years and still produce good yields. Johnson grass, cotton, corn, oats, and melilotus are the principal crops, and of these Johnson grass occupies the largest acreage. The type is largely devoted to stock raising. Beef cattle and a few dairy cows are kept in nearly every pasture.

All the corn and oats and most of the hay are fed to the work stock and cattle on the farm. A small quantity of Johnson grass hay is sold at the local markets.

Corn yields about 10 to 35 bushels per acre, cotton one-fourth to three-fourths bale under best conditions, oats 15 to 25 bushels, and Johnson grass one-half to $1\frac{1}{2}$ tons of hay to the cutting, with an average of three cuttings a year.

When wet this soil is very sticky, but under proper moisture conditions it is moderately friable and works into a good tilth. In uncultivated fields during very dry weather it bakes and cracks. No commercial fertilizer is used on this type. Barnyard manure is used to a small extent.

Land of this type sells at about \$12 to \$25 an acre, depending upon improvements and location.

The Sumter clay can be greatly improved by deep fall plowing, a more extensive use of winter cover crops, and the growing of velvet beans, soy beans, and cowpeas between the corn rows.

Sumter clay, flat phase.—The flat phase of the Sumter clay differs from the typical soil in having a deeper and darker surface soil and a more pronounced yellow or greenish-yellow subsoil. Were it not for the lime nodules present throughout this phase and the different forest growth which it supports it would be difficult to distinguish it from the Montrose clay.

The largest areas of this phase occur along the headwaters of Tallahala and Quarterliah Creeks. The topography is level to flat,

and the drainage is considerably poorer than that of the typical soil.

The same crops are grown as on the Sumter clay, but the yields are slightly lower. The same methods of cultivation are employed, and no commercial fertilizer is used.

Land of this phase sells for about \$10 to \$20 an acre.

Better drainage is the chief need of this soil. Where the lime content is low an application of rotten limestone taken from adjoining areas and scattered over the surface will materially improve the physical condition of the soil and increase the yields.

OKTIBBEHA SANDY LOAM.

The Oktibbeha sandy loam consists of a light-brown to grayish sandy loam, passing into pale-yellow sandy loam, which is underlain at a depth of 8 to 12 inches by a red clay, or by yellowish sandy clay or clay loam mottled with gray and red, passing at about 15 inches into brown, plastic clay mottled yellow, gray, and red. Some of the stream slopes in this type, where the surface soil has been washed off, closely resemble the Montrose clay. In places small, rounded gravel of quartz and chert are present in the surface soil.

The type has a patchy occurrence in the southwestern prairie section of the county, some of the largest areas lying west and southwest of Rush School, south of Spring Grove Church, and east and west of Roberts. Some areas occupy low knolls and ridges and are well drained, while others are level and poorly drained.

Owing to its small extent, the Oktibbeha sandy loam is not a very important type. Probably half of it is under cultivation. A part of the type is forested with longleaf and shortleaf pine, post oak, red oak, blackjack oak, and an occasional hickory.

Cotton, corn, oats, peanuts, and sweet potatoes are the principal crops grown. Some fields support a dense growth of lespedeza and wild grasses and are used for grazing beef cattle.

Cotton yields one-third to three-fourths bale per acre, and corn 10 to 20 bushels for the first few years, but the yields diminish rapidly unless steps are taken to maintain the productiveness of the land. Oats do fairly well if sowed in the fall, yielding 15 to 25 bushels per acre. The soil is generally plowed in the early spring with one-horse plows. Commercial fertilizers and barnyard manure are used to some extent.

Owing to its sandy nature this soil is much easier to handle than the Oktibbeha clay, and can be worked under a much wider range of moisture conditions.

The Oktibbeha sandy loam sells at about \$8 to \$15 an acre, the value depending upon the location and development.

For the best development of the Oktibbeha sandy loam, the type should be well drained by the use of open ditches. Owing to the heavy, sticky subsoil, tiles would have to be placed very close together and would prove very expensive. Planting winter cover crops, such as oats and rye, and planting more velvet beans and soy beans between the growing crops would prove beneficial.

In the following table are given the results of the mechanical analyses of the samples of the soil and subsoil of the Oktibbeha sandy loam :

Mechanical analyses of Oktibbeha sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423653.....	Soil, 0 to 10 inches.	1.9	15.6	15.8	27.4	5.4	26.8	6.7
423654.....	Subsoil, 10 to 36 inches.....	1.2	8.0	7.2	12.4	2.6	40.2	28.3

OKTIBBEHA CLAY.

The Oktibbeha clay consists of a brownish-red clay, passing abruptly into a mottled red and drab, or red, drab, and pale-yellow plastic clay. In places there is a thin surface covering of brownish loam, gravelly loam, or sandy loam. The lower subsoil closely resembles the corresponding section of the Susquehanna types, but in exposures it tends to crumble more than the Susquehanna material. In places the chalky, calcareous material composing the substratum is encountered within the 3-foot section, and occasionally it is exposed at the surface. There are some included patches of the Sumter and Montrose clays.

The Oktibbeha clay is associated with the other prairie soils of the county and is locally referred to as "red prairie." The largest area occurs in the vicinity of Eureka Church. It occupies the higher elevations in these prairies and the surface is well drained. During heavy rains the run-off is excessive and erosion takes place.

Only a small percentage of this type is at present under cultivation, the greater part being used for pasture.

Cotton, corn, and cowpeas are grown, giving fair yields. Bermuda grass affords considerable pasturage during the summer months, while white and hop clover are conspicuous in the pastures in spring. Red clover does very well. Melilotus and Johnson grass do well and are useful in arresting erosion where gullies have begun to form. Some beef cattle are pastured on the type.

When not damaged by the boll weevil, other conditions being favorable, cotton yields about one-fourth to three-fourths bale per

acre. Corn yields 10 to 20 bushels per acre, depending upon the seasonal conditions. No fertilizer of any kind is used.

Land of the Oktibbeha clay sells at \$10 to \$20 an acre, depending upon location and improvements.

For best results with this type deep fall plowing and a more extensive growing of leguminous crops are necessary. The type is particularly well suited to stock raising and dairying and its greatest development should be along these lines.

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam consists of a grayish-brown to brown loamy fine sand, underlain at 10 to 15 inches by a yellowish-red to dull-red fine sandy loam to sandy clay which in places is decidedly silty. Slight mottlings of yellow and gray are occasionally encountered in the subsoil. A variation of the type occurs in which the subsoil approaches a loamy sand in texture. In the northwestern corner of the county there are a few included small patches of Cahaba silt loam.

The Cahaba fine sandy loam is a second-bottom type occurring along the streams throughout the county. The topography ranges from level to gently sloping, and the drainage is well developed.

The type is inextensive but, owing to its productiveness, is an important agricultural soil. About 90 per cent of it is under cultivation. Cotton, corn, oats, sweet potatoes, peanuts, sugar cane, and sorghum are the principal crops.

With the exception of sweet potatoes, which are frequently sold to the canning factory at Newton, and other vegetables, of which some are disposed of at local markets, nearly all the crops grown on this type are used on the farm.

Corn yields about 15 to 35 bushels; cotton, under the best conditions, one-fourth to three-fourths bale; oats, 15 to 25 bushels; sweet potatoes, 100 to 200 bushels; and sugar cane, 200 to 400 gallons of sirup per acre.

The soil is easily handled and can be plowed under a wide range of moisture conditions. One-horse implements are in general use. Some farmers apply commercial fertilizers containing chiefly nitrogen and phosphoric acid, and where available barnyard manure is added.

Land of this type sells at \$12 to \$30 an acre, depending upon the location and improvements.

For the improvement of the Cahaba fine sandy loam it is recommended that winter cover crops, including oats, wheat, and rye, be more extensively planted, and that leguminous crops, such as velvet beans, soy beans, and cowpeas, be planted between the corn rows.

KALMIA VERY FINE SANDY LOAM.

The Kalmia very fine sandy loam consists of a grayish very fine sandy loam, passing into a pale-yellow very fine sandy loam, which is underlain at about 10 to 20 inches by a yellow, friable sandy clay. In the more poorly drained areas the lower subsoil contains brownish and grayish mottlings. Most of the poorly drained areas also contain small, dark-colored concretions, from which they derive the local name "buckshot land." Some patches of Kalmia silt loam and very fine sandy loam are included with this type as mapped.

The Kalmia very fine sandy loam is developed on the second bottoms or terraces of most of the large streams of the county. It lies either entirely above overflow or above normal overflow. Some of the largest areas occur along Potterchitto Creek in the vicinity of Doolittle, Hickory, and Chunky stations, and along Bethel, Sunflower, and Bogue Falena Creeks. The surface is characteristically flat. A few areas, however, are slightly undulating, and some are slightly depressed. Drainage is fairly well established, except in some of the low-lying areas.

Although the Kalmia very fine sandy loam is not nearly so extensive as some of the sandy upland types, it is important agriculturally. Probably 75 per cent of it is either in cultivation or is used as pasture land, the remainder being forested with oak, gum, and shortleaf and longleaf pine.

Cotton, corn, sugar cane, oats, lespedeza, and vegetables are the principal crops. Before the boll weevil became prevalent cotton was the most extensively grown crop on this type, but at present corn occupies the largest area. Many of the pastures support an excellent growth of lespedeza and wild grasses for 10 months of the year, and a considerable area is used for pasturing cattle.

Corn yields about 10 to 35 bushels; cotton, under the best conditions, one-fourth to three-fourths bale; oats, 15 to 25 bushels; and sugar cane, 250 to 500 gallons of sirup per acre.

The Kalmia very fine sandy loam is easily tilled and when plowed at the right time works up into a loose, mellow seed bed. If plowed too wet it tends to clod, but the clods can be easily broken up with a harrow or drag. Commercial fertilizer is used on this type to a small extent, the most popular mixture consisting of equal proportions of phosphoric acid and cottonseed meal. This mixture is usually applied to cotton and corn at the rate of 150 to 250 pounds per acre, while for truck crops and sugar cane applications ranging from 500 to 1,000 pounds are sometimes used.

Land of the Kalmia very fine sandy loam sells at \$10 to \$50 an acre, depending upon location with respect to railroads and upon improvements.

For best results in the handling of this type the fields must be well drained. Acreage applications of 1,000 to 2,000 pounds of crushed limestone have been found beneficial on land of this kind. Planting cowpeas, soy beans, and velvet beans between the rows of corn increases the productiveness of the type for subsequent crops.

In the following table are given the results of the mechanical analyses of samples of the soil and subsoil of the Kalmia very fine sandy loam:

Mechanical analyses of Kalmia very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423609.....	Soil, 0 to 10 inches.	0.3	2.9	2.8	30.3	8.4	47.2	7.7
423610.....	Subsoil, 10 to 36 inches.....	.4	2.3	2.4	27.4	6.9	45.5	14.6

MYATT VERY FINE SANDY LOAM.

The Myatt very fine sandy loam consists of a gray very fine sand, passing at 5 or 6 inches into a mottled gray and pale-yellow very fine sandy loam, which is underlain at a depth of 18 to 24 inches by mottled gray and yellow, plastic clay containing pockets or layers of mottled gray and yellow very fine sandy loam. A deep variation occurs in which the material to a depth of about 30 inches consists of a gray to nearly white very fine sand or loamy very fine sand, underlain by mottled gray and yellow very fine sandy loam. The type is locally termed "crawfish" land.

The Myatt very fine sandy loam is a terrace or second-bottom type and has its largest development on the terraces adjacent to the overflowed bottoms of Warrior, Tuscolameta, and Conehatta Creeks. The surface is prevailingly flat, and drainage is poorly developed. There are occasional depressions from which water escapes mainly by evaporation. The streams through this type are sluggish and usually strips of semiswampy land occur along their courses.

The Myatt very fine sandy loam is not an important type. Only about 10 per cent of its total area is under cultivation, most of the remainder being forested with pine, oak, sweet gum, black gum, beech, bay, and dogwood, with an undergrowth of redbud and gallberry bushes.

Corn and hay are the principal crops. Corn leads in acreage, followed by lespedeza and other wild grasses. Owing to the luxuriance of the grasses, the type makes excellent pasture land. Some beef cattle are now grazed on it.

The soil does not warm up until late in the spring, and for this reason it is seldom used for cotton under the prevailing boll-weevil conditions, or for early truck crops.

Although this type contains considerable fine and very fine sand, it has a tendency to compact in dry weather, making it difficult to plow. On the other hand, if the soil is plowed when wet it forms clods which on drying are hard to pulverize. Only a few of the farmers on this type use commercial fertilizer. The mixture used consists of equal proportions of cottonseed meal and phosphoric acid.

The Myatt very fine sandy loam sells at \$5 to \$12 an acre, depending upon location, drainage, amount of timber standing, and improvements.

For the best development of this type open ditches or tile drains should be installed, deep fall plowing practiced, and leguminous crops such as cowpeas and velvet beans more extensively grown. The soil is decidedly acid and acreage applications of 2 to 4 tons of crushed limestone would likely improve it.

TRINITY CLAY.

The Trinity clay consists of a brown to dark-brown or black clay, passing at about 3 to 8 inches to a yellowish-brown, rather sticky clay, occasionally faintly mottled in the lower part with drab. In places the soil is black and a foot or more deep. It is generally much darker in color than the Houston clay, owing to the presence of considerable organic matter. Usually both surface soil and subsoil effervesce with hydrochloric acid, showing them to be calcareous. The soil is sticky when wet, but becomes crumbly when dry. Some patches of Ochlockonee clay and loam too small to map are included with this type.

Trinity clay is confined to the southwestern part of the county, occupying first bottoms along the stream courses in the prairie section, where some of the drainage is from Houston and Sumter soils. Along a number of upland drainageways which carry water only during heavy rains there are strips of Trinity clay too small to separate from the adjoining Houston and Sumter soils. The surface is prevailingly level, with some sloping areas along the smaller streams. The streams through this type have shallow, winding channels, and natural drainage is in many places inadequate.

The Trinity clay is one of the most productive soils in the county. About 75 per cent of it is in cultivation, the remainder being either too poorly drained for successful cultivation or in forest. It is adapted to a variety of crops, including corn, cotton, and grasses. Johnson grass grows luxuriantly, producing large yields of a good

quality of hay. Cowpeas, lespedeza, and sorghums also give good results. Where drainage is well established alfalfa does well.

Few cattle are raised on this type, except where owned in connection with the upland prairie soils. Nearly all the corn and hay produced is used for feeding work stock on the farm and for winter feeding of cattle. A small quantity of Johnson-grass hay is sold in the local markets.

Corn yields ordinarily about 20 to 40 bushels per acre, and where tile drainage has been established as much as 75 bushels. Cotton makes a large growth, and where not damaged by the boll weevil yields of one-half to 1 bale per acre are obtained. Johnson grass gives 3 to 5 cuttings in favorable seasons, with an average yield of about 3 tons per acre for the season. Oats sown in the fall yield from 20 to 35 bushels per acre.

The Trinity clay is rarely, if ever, offered for sale separately. As with the Houston and Sumter soils, its value is gradually increasing, owing to the extension of stock raising.

The most effective means for increasing yields on this type is the improvement of drainage. Deep plowing should be practiced and leguminous crops more extensively grown.

BIBB FINE SANDY LOAM.

The Bibb fine sandy loam consists of a gray fine sandy loam mottled with yellowish-brown, underlain by a mottled gray and yellow fine sandy clay, interstratified with mottled gray and yellowish-brown fine sandy loam. Small, black concretions are present in many places, especially in the subsoil. This type includes patches of Ochlockonee and Lee fine sandy loams near the channels of the streams.

The principal areas of this type occur along the first bottoms of Tuscolameta, Potterchitto, Oakahatta, Tallasher, and Concobona Creeks. The topography is level, except for occasional slight depressions marking the location of former stream channels, and a few swells or hummocks. This type is subject to overflows, which frequently are deep and prolonged, especially in winter and spring. The stream channels are prevailingly shallow, so that moderately heavy rains cause floods. Between overflows the drainage is imperfect, probably because of an impervious substratum.

Probably 85 per cent of this type is forested, much of the timber being merchantable. The principal trees are overcup oak, willow oak, white oak, sweet gum, black gum, Tupelo gum, beech, ironwood, swamp pine, birch, willow, and holly, with a little hickory. The trees are shallow rooted, owing probably to poor underdrainage.

The Bibb fine sandy loam is not important agriculturally. Only a few patches have been cleared and cultivated. The principal crops are corn, cotton, sugar cane, and hay. A good many beef cattle and hogs are pastured, but there are no large stock farms.

This is naturally a rather late soil, but crops grow satisfactorily where the land has been ditched. The yields of cotton in the last few years have not been good, owing to the ravages of the boll weevil. Prior to the advent of this pest three-fourths to one bale per acre was sometimes obtained. Corn yields 10 to 35 bushels per acre, depending largely on the season. Occasionally all crops are destroyed by overflows.

Farmers on this type practice shallow plowing. No fertilizers are used.

The value of the Bibb fine sandy loam depends largely upon the stand of timber. It can probably be bought for \$15 to \$75 an acre.

Owing to the expense that would be involved in canalling the streams to minimize overflows little can be done along this line without cooperation among the landowners on a large scale. Organization of this sort has been successful in other counties of the State, notably Lee and Oktibbeha. Where small areas are cleared by individual farmers it would be advisable to ditch the land rather closely or else to install tile drains. As this type produces an abundance of lespedeza in every clearing, and other grasses, including Bermuda, do well, it would seem that the land could be profitably cleared and used for the production of hay and for pasturing cattle.

The results of the mechanical analyses of the soil and subsoil of the Bibb fine sandy loam are given in the following table:

Mechanical analyses of Bibb fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
423605.....	Soil, 0 to 15 inches.	0.0	1.0	3.0	61.6	8.6	19.3	6.4
423606.....	Subsoil, 15 to 36 inches.....	.3	1.0	2.4	58.2	7.8	21.5	8.3

BIBB LOAM.

The surface soil of the Bibb loam is a mottled gray or drab and rusty-brown or yellow-brown loam, in which the gray or drab becomes more conspicuous with depth, the subsurface layer frequently being almost white. The subsoil is a gray or drab, plastic clay, mottled with yellow or yellowish brown, and frequently including pockets or layers of nearly white silty material. There are included areas of Lee loam, having a brown loam surface soil and very mottled subsoil.

This type is developed along the first bottoms of Conehatta, Brushy, Caney, Barnett, and Scotchenflipper Creeks. In position, drainage conditions, and timber growth it is similar to the Bibb fine sandy loam.

Only about 5 per cent of this type is cultivated. The same crops are grown as on the Bibb fine sandy loam, the yields being slightly higher. Cleared areas invariably support a dense growth of lespedeza and wild grasses.

The soil is plowed shallow and no commercial fertilizers are used.

Land of this type is valued at present almost exclusively for its timber and grasses, and under existing conditions its most profitable agricultural use is for grazing and hay production. Should a drainage district be established and the streams be canalled, this probably would be one of the best types in the county for the production of corn.

OCHLOCKONEE LOAM.

The Ochlockonee loam consists of a brown loam, underlain by a light-brown or yellowish-brown loam, silty clay, or sandy clay, which in places shows some gray mottlings in the lower part. There are included areas of Ochlockonee fine sandy loam and silt loam, Lee loam, fine sandy loam, and silt loam (brown soil with mottled subsoil), and Hannahatchie soils (reddish-brown soils containing material washed from red uplands, such as Greenville); also areas of "reed-break" land, which varies both in texture and color. Some areas consist of a black loam or silt loam, 15 to 20 inches deep, underlain by almost white sand, and others of black loam to a depth of 36 inches, very much resembling muck.

The Ochlockonee loam is developed along some of the larger drainageways in the county, such as Chunky, Tallasher, Potterchitto, Turkey, Tallahatta, and Bollybusha Creeks, and various other streams of less importance. The surface is uniformly level, except in cases of abandoned stream channels and sloughs and minor depressions caused by erosion during floods. The type is subject to frequent overflows, but taken as a whole it occupies the better drained bottoms outside the southwestern prairie section of the county.

The Ochlockonee loam is the most important bottom-land soil in the county both in respect to extent and productiveness. Only a rather small percentage of this type is cultivated, the greater part supporting a forest growth consisting of swamp pine, water oak, pin oak, post oak, willow, beech, magnolia, hickory, holly, and bay, with an undergrowth of cane and blackberry.

Corn, cotton, oats, cowpeas, sorghum, sugar cane, and lespedeza hay are the principal crops. Corn leads in acreage. Where cleared

the type supports a dense growth of lespedeza and other wild grasses. Wild cane also thrives along the outer edges of the bottoms and along the smaller streams. Beef cattle and dairy cows are grazed on this type, but there are no large stock farms.

Occasionally some corn is sold, but as a rule all crops are used on the farm.

Before the advent of the boll weevil, cotton yields on this soil ranged from three-fourths bale to $1\frac{1}{4}$ bales per acre. Corn yields ordinarily about 20 to 45 bushels per acre, while the "reed-break" areas frequently produce from 60 to 75 bushels. Oats yield from 15 to 35 bushels and sugar cane from 200 to 500 gallons of sirup per acre.

This type is cultivated for the most part with one-horse implements and plowing is shallow. Corn is planted on ridges. It is not deemed advisable to plant in the water furrow. No commercial fertilizer is used.

Land of the Ochlockonee loam sells at \$20 to \$50 an acre, depending upon location, liability to overflow, and amount of standing timber.

If farmers having Ochlockonee loam land would cooperate in forming a drainage district and having the main stream ditched it would result not only in opening up some of the most productive land in the county but in improving the health of the communities as well. Areas of this type now farmed should be well ditched or tiled.

SUMMARY.

Newton County is situated in the east-central part of Mississippi. It has an area of 579 square miles, or 370,560 acres.

The topography varies from level or gently undulating prairie to gently rolling, hilly, ridgy, and rough, sandy uplands. The elevation ranges from 412 feet above sea level at Newton to 471 feet above at Union. The county is drained mainly by Chunky, Tuscolameta, Tallahatta, and Tallahala Creeks and their tributaries.

Newton County has a population of 23,085, by far the greater part of which is engaged in agriculture. The principal towns are Newton, Union, Hickory, Decatur, Chunky, Lawrence, Stratton, Little Rock, Scanlon, and Duffee.

Transportation facilities are good, the county being traversed by four railroads. The public roads are worked by contract and are for the greater part of the year in good condition. The county is well supplied with schools and churches. Rural mail routes reach nearly every section and telephones are in general use. Meridian and Jackson are the principal markets.

The climate is mild and healthful. The mean annual temperature is 63.2° F., and the mean annual precipitation 51.20 inches. There is a minimum growing season of 194 days.

The agriculture of Newton County consists chiefly of the production of general farm crops, such as cotton, corn, oats, hay, velvet beans, cowpeas, sweet potatoes, peanuts, sorghum, sugar cane, and truck. Crops are grown both for home consumption and for sale. Beef cattle, hogs, and dairy cows are raised throughout the county. The 1-horse plow is in general use, but modern farm machinery is gaining in importance. Systematic crop rotations are not in general use. Fertilizers are used on the sandy upland types throughout the county.

A fair supply of labor is available, wages ranging from \$12 to \$15 per month with board.

The farms range in size from a few acres to several thousand acres, the average size being 79.6 acres.¹ Farm land sells for \$5 to \$75 an acre, depending upon location and improvements.

Newton County lies entirely within the Coastal Plain Province. The soils are derived from sedimentary formations of heavy clay, sandy clay, limestone, and the white siliceous rock belonging to the Tallahatta buhrstone formation. The second bottoms or terraces and the overflow bottoms are made up of material which has been washed down from the uplands.

The upland soils of the county are included in the Ruston, Orangeburg, Susquehanna, Pheba, Lauderdale, Greenville, Houston, Sumter, Montrose, and Oktibbeha series, the second-bottom soils in the Cahaba, Kalmia, and Myatt series, and the first-bottom soils in the Ochlockonee, Trinity, and Bibb series.

The Ruston fine and very fine sandy loam are the two most extensive and important soil types in the county. The Ruston silt loam is inextensive. These soils are well suited to cotton, corn, oats, and legumes, such as cowpeas and velvet beans.

The Orangeburg fine sandy loam is considered a very important soil type, being well suited to growing cotton. The Orangeburg very fine sandy loam, although somewhat more productive than the fine sandy loam, is of little importance owing to its small extent. The Orangeburg sand is of very little importance, being poorly drained and inextensive.

The Susquehanna fine sandy loam and very fine sandy loam are used mainly for the production of cotton and corn and for pasturing beef cattle. The very fine sandy loam is distributed throughout the county and is considered a rather important type.

¹ Each tenancy is tabulated as a "farm."

The Greenville silt loam and clay loam are well drained types, used chiefly for the production of cotton, corn, oats, cowpeas, and velvet beans. The clay loam, though inextensive, is considered a very important type and some of the best farms in the county are located upon it.

The Pheba silt loam is developed in small, scattered areas and is of only moderate importance.

The Lauderdale stony loam is rather extensive but unimportant, its uneven surface and stony nature rendering it unsuitable for cultivation.

The Montrose silt loam is inextensive and not very important. Only about 20 per cent of it is cultivated, cotton being the principal crop. The Montrose clay is rather widely distributed and about 35 per cent of its area is under cultivation.

The Houston clay is inextensive, but about 90 per cent of its area is either in cultivation or is used as pasture land.

The Sumter clay is inextensive, but nearly all of it is either in cultivation or is used as pasture and hay land. It is largely devoted to stock raising.

The Oktibbeha sandy loam and clay are inextensive and unimportant. The clay is locally referred to as "red prairie." Cotton, corn, and cowpeas give fair yields.

The Cahaba fine sandy loam, though inextensive, is important owing to its productiveness. About 90 per cent of its area is under cultivation.

The Kalmia very fine sandy loam, while not nearly so extensive as some of the sandy upland types, is important agriculturally.

The Myatt very fine sandy loam is unimportant. Only about 10 per cent of its total area is in cultivation, most of the remainder being forested. Corn and hay are the principal crops.

The Trinity clay is one of the most productive soils in the county. About 75 per cent of its area is in cultivation. It is suited to the production of a variety of crops, including corn, cotton, and grasses.

The Bibb fine sandy loam and loam are unimportant. Only a few small areas have been cleared and cultivated.

The Ochlockonee loam is the most important bottom-land soil in the county, both in respect to extent and productiveness. Only a small percentage of it is cultivated, the greater part being in forest.

The soils of Newton County compare favorably with those of the adjoining counties. They are capable of being built up to a high state of productiveness, and offer good opportunities for stock raising, market gardening, and poultry raising in connection with general farming.

[PUBLIC RESOLUTION—No. 9.]

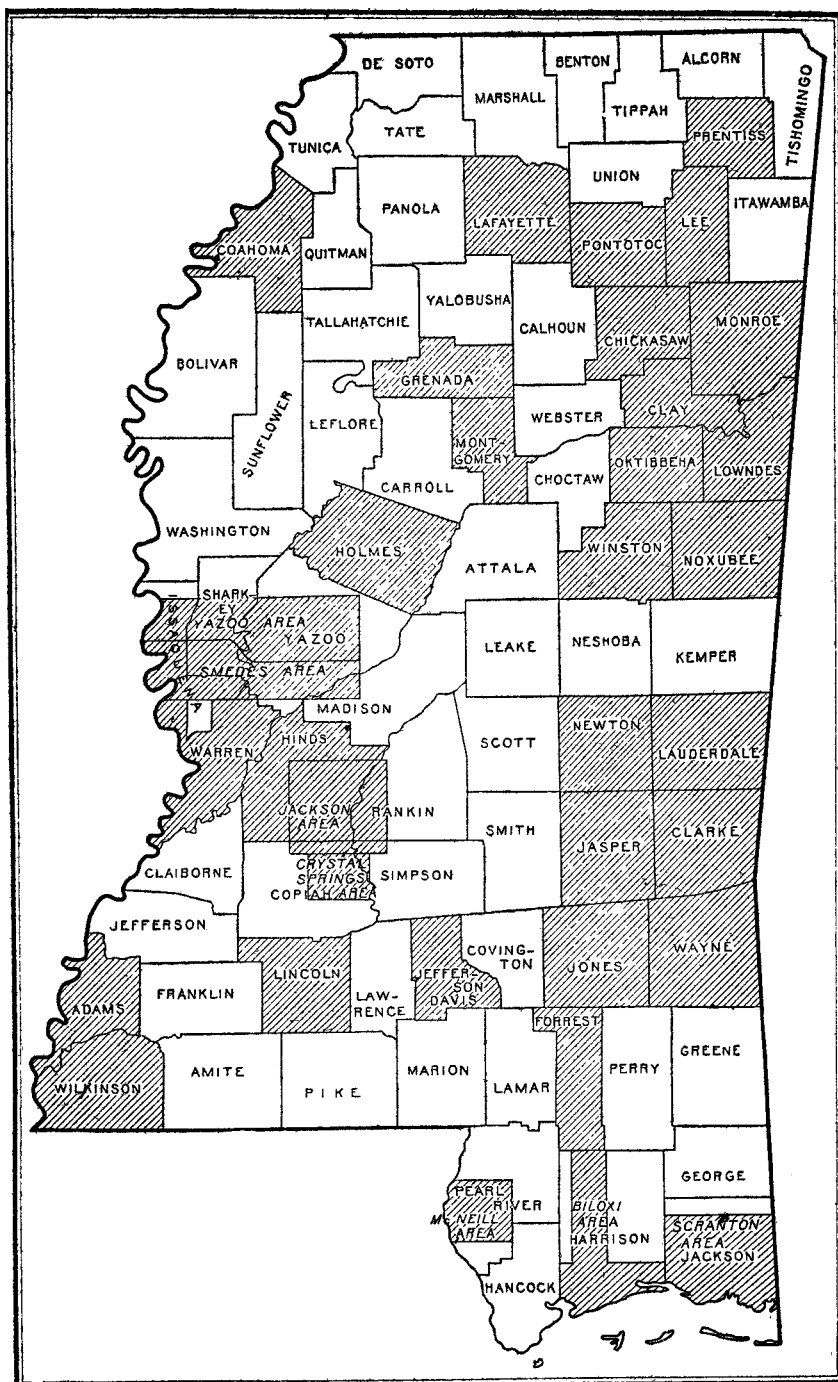
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved. March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]



Areas surveyed in Mississippi.

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LEGEND

Ruston fine sandy loam R	Oktibbeha sandy loam O
Ruston very fine sandy loam Rs	Oktibbeha clay Oc
Ruston silt loam Ri	Bibb loam Bi
Orangeburg sand Os	Bibb fine sandy loam B
Orangeburg fine sandy loam Of	Sutler clay Sc
Orangeburg very fine sandy loam Ov	Flint phase F
Susquehanna fine sandy loam Sf	Pheba silt loam P
Susquehanna very fine sandy loam S	Houston clay H
Montrose silt loam M	Kalmia very fine sandy loam K
Montrose clay Mc	Myatt very fine sandy loam Mi
Greenville silt loam G	Cahaba fine sandy loam C
Greenville clay loam Gc	Odolesonee loam O
Lauderdale silt loam L	Trinity clay T

CONVENTIONAL SIGNS

CULTURE (Printed in black)

City or Village Roads Buildings Wharves Jetty Breakwater Lighthouse Fort	Railroads Steam and Electric Canals
Secondary roads and Trails	Railcrossing Tunnel
Brigade Ferry	School or Church
Ford Dam	Concessions
Mine or Quarry Mine dumps Made land	Bluff Escarpment Rock outcrop and Triangulation station
Stony and Gravelly areas	Soil boundaries
STATE COUNTY	LAND GRANT TOWNSHIP
Boundary lines	Boundary lines
CIVIL OWNERSHIP RESERVATION	Boundary lines
Boundary lines	U.S. Township and section lines

RELIEF (Printed in brown or black)

Contours	Prominent Hills Mountain Peaks
Depression contours	
Sand Wash and Sand dunes	Shore and Low water line Sandbar

DRAINAGE (Printed in blue)

Streams	Lakes Ponds Intermittent lakes
Intermittent Streams	Spring Cones and Mud Flows
Swamp Salt marshes	Submerged marsh Tidal flats

*The above signs are in
current use on the soil
maps. Variations from this
usage appear in some
maps of earlier dates.*